Airborne 58

Installation and User Guide

Rev 3.0 - January 17, 2018

Contents

Technical Support

For assistance with any Teletics product, please call us or visit our website.

Technical Support   **1-587-351-1900**

Website   www.teletics.com/support

Statement of Conformity

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

Contains FCC ID: TV7RB912G-5HPND

Introduction

The Teletics Airborne is a wireless data network designed for use with temporary or mobile camps or any location that might need on site communications between buildings that has to be set up quickly and reliably. The Airborne provides this functionality without the need to run any wire or cable between buildings.

The Airborne system can be used on its own, or connected to other communications systems that provide "backhaul" to the outside world, such as satellite communications, or cellular backhaul links.

Key Airborne features:

- Up to 20 Airbornes can be supported on each radio channel.

- 3 non-overlapping radio channels available.

- Each system may be programmed with a unique system serial number, in order to prevent similar systems being operated close together from communicating with each other.

- +24VDC operation with Power over Ethernet.

- 5.8 GHz radios w/ 500 mW radio power output.

- Simple programming using Teletics TUtil programming software.

- Encrypted, spread spectrum radio technology provides security.

- Units can be added, removed, or moved from any system to another system with TUtil programming software.

Using the Teletics Airborne

Overview

The Airborne radio system is part of the Teletics family of products that includes the very successful w*intercom system, used on thousands of drilling rigs throughout the world. The Airborne MESH radio system has been proven in very challenging industrial environments and it is simple to setup and use.

Each Airborne has an Ethernet port for use with a computer. All Airborne units in a system act as a common unmanaged Ethernet switch, sharing the available bandwidth on the system.

The Ethernet connection provided by an Airborne system is completely transparent to anything else being sent over the network. You should simply treat it as a "wireless wire". The data speed for the Airborne system is 12 to 48 Mbps, depending on signal strength. This is similar to standard office Ethernet speeds on 100BT Ethernet, and this connection is always faster than the internet connection backhaul provided by satellite or cellular that is provided to the site.

Recommended Enclosures, Accessories, Cabling and Antennas

The number one support issue we encounter is with choices of antennas, cabling, and proper installation to prevent water from getting inside RF connectors. For this reason, the Airborne 58 has integrated antennas, which are not serviceable or field replaceable.

The Airborne is designed for use outdoors with its integrated omnidirectional antennas. Mounting the Airborne is as easy using the supplied right angle mounting bracket, and the supplied J-Mount.

Teletics has found that a few of our customers have previous experience with third party power supplies and have chosen a vendor that they already trust. Please choose a power supply capable of delivering at least 1A continuous at a regulated +24VDC output +/- 5% capable of operation over the anticipated operating temperatures. One of the third-party power supplies that Teletics has tested is the Meanwell AD-155B power supply, which includes a simple charging circuit for charging a +24V Sealed Lead Acid battery. Optionally, Solar power could also be used, assuming the use of +24VDC solar systems.

The Teletics Airborne 58 has a weather sealed Ethernet connector, that when properly assembled will keep moisture out of the RJ45 connector while the Airborne is operating outside.

Connections

The Airborne connectors are:

LAN is for connection to either a computer or a computer network. The DATA ports on all units in an Airborne system act like a computer hub. There is no routing between them, and each unit has equal priority. The LAN cable supplies power over Ethernet (PoE), with **+24VDC** for providing power to the unit, using the PoE injector provided.

Installation

The Airborne system uses MESH technology, which allows each unit to get a repeater in the system, thereby allowing any unit to talk back to the master, through any other units that are along a path back to unit 11. A system may contain as few as 2 Airborne units, or as many as 20.

For any Airborne system to correctly operate, you will need to program one Airborne as unit 11. The rest can be programmed as any number from 12 through 30, however you cannot have two Airborne units with the same number in one system. A system may contain up to 20 Airborne units.

Each Airborne unit has its own serial number that is assigned at the factory. This is on the label of each unit. Additionally, the TUtil Airborne 58 programming software (available for free download at Teletics.com/support) allows you to set a Group ID as well, which is a common identity code which is used to group units into one system together. The Group ID can be any alpha numeric sequence you would like, up to 10 characters or numbers.

When Teletics Airborne systems leave the factory, they are tested and shipped as systems with one master and 7 stations. They are numbered 11, 12, 13, 14, 15, 16, 17, 18, and the Group ID for the system is the same as the serial number for the Unit 11 master. The factory default channel is channel 149. These systems may be deployed right out of the carton as an 8 station system.

However, for example, let's assume that we have a brand new Airborne system in its carton in our shop, and we have two additional "loose" units that we want to make into one 7 station system. For our example let's assume that they have the following serial numbers:

	Unit	Serial Number	Group ID
Complete System:	Unit 11	0805-0360	0805-0360
	Unit 12	0805-0361	0805-0360
	Unit 13	0805-0362	0805-0360
	Unit 14	0805-0363	0805-0360
	Unit 15	0805-0364	0805-0360
Loose Units:	Unit 12	0802-0301	unknown
	Unit 14	0802-0303	unknown

Therefore, the fastest way to program our example system is to program the loose units to Unit 16 and Unit 17 using TUtil Airborne 58, using the Group ID of the new, complete system, which is 0805-0360. Also, keep in mind that you should use the TUtil factory default channel of Channel 149.

One other way to accomplish the same thing is to reprogram all of the units using a serial number of your choice, such as A1B2C3D4, or SITE4567.

Keep in mind that all serial numbers are case sensitive!

Once you have the Airborne units programmed, it is a good idea to test them as a system to ensure that each unit can call the other units in the system. When you power up any Airborne, you should wait about a minute for it to link to the other Airborne radios that are in the same GroupID.

Indicators and Controls

Power LED on the PoE injector indicates power has been applied to the unit.

Instructions for Use

Once all Airborne units have power applied, and they have had about a minute to initialize, all of the Ethernet connections of Airbornes programmed with the same GroupID will be part of the same switched network connection. These connections will behave as if they are all plugged into the same Ethernet switch. There is no requirement to set any IP addresses on the Airbornes to have the computers on the network "see" each other. However, the computers being used with the Airbornes will have to have their network settings correct.

Troubleshooting

Radio problems generally show up as either inability to network computers from one Airborne to another. Wireless networking problems can be caused by a number of issues, including:
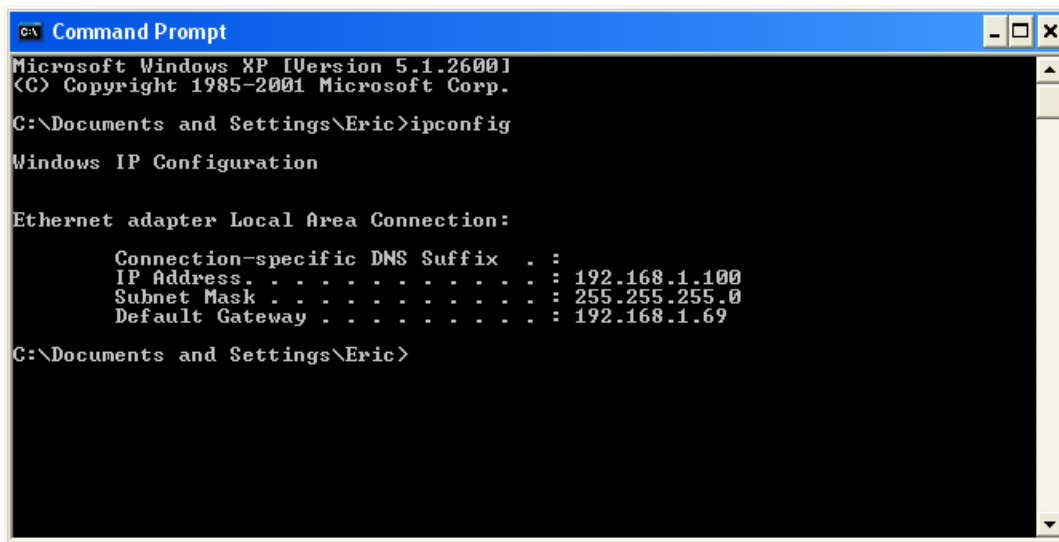
- Cabling related issues

    - Poor quality connectors

    - Not using supplied ethernet cables for installation

    - Field made cables not compliant to T-568A or T-568B

    - Bad cable assembly practices

    - Cable assemblies not tested / rated for frequency of operation

- Questionable radio line of sight. The Airbornes will find each other, but you still need to "connect the dots".

- Interference in the same frequency used by the Airborne system

- A bad radio in the Airborne unit

The best way to diagnose a radio path problem is to use TUtil on a computer at the master from each Airborne unit. There is a radio signal strength tool for field use called TUtil, which can be downloaded from the Teletics website.

However, if you are experiencing problems accessing the internet try pinging one of the other computers or routers on the Airborne system first. To do this, go to a computer on the Airborne system, and open up a command prompt window. (Usually under Start, Programs, Accessories, Command Prompt.)

Type this command: ipconfig

You should see some basic network addresses, and more importantly, something called a default gateway address:

First, you should ping the IP address:

Ping 192.168.1.100 (or whatever numbers you see next to IP Address when you ran ipconfig):

```
Command Prompt                                                    _ □ ×

Windows IP Configuration


Ethernet adapter Local Area Connection:

        Connection-specific DNS Suffix  . :
        IP Address. . . . . . . . . . . : 192.168.1.100
        Subnet Mask . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . : 192.168.1.69

C:\Documents and Settings\Eric>ping 192.168.1.100

Pinging 192.168.1.100 with 32 bytes of data:

Reply from 192.168.1.100: bytes=32 time<1ms TTL=128
Reply from 192.168.1.100: bytes=32 time<1ms TTL=128
Reply from 192.168.1.100: bytes=32 time<1ms TTL=128
Reply from 192.168.1.100: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\Eric>
```

If you get a reply back from the IP address, it means your network port in the computer seems to be working. Next try to ping your default gateway address:

Ping 192.168.1.69 (again, use whatever numbers are next to Default Gateway on your computer):

```
Command Prompt                                                    _ □ ×

Reply from 192.168.1.100: bytes=32 time<1ms TTL=128
Reply from 192.168.1.100: bytes=32 time<1ms TTL=128
Reply from 192.168.1.100: bytes=32 time<1ms TTL=128
Reply from 192.168.1.100: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\Eric>ping 192.168.1.69

Pinging 192.168.1.69 with 32 bytes of data:

Reply from 192.168.1.69: bytes=32 time<1ms TTL=64
Reply from 192.168.1.69: bytes=32 time<1ms TTL=64
Reply from 192.168.1.69: bytes=32 time<1ms TTL=64
Reply from 192.168.1.69: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.69:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\Eric>
```
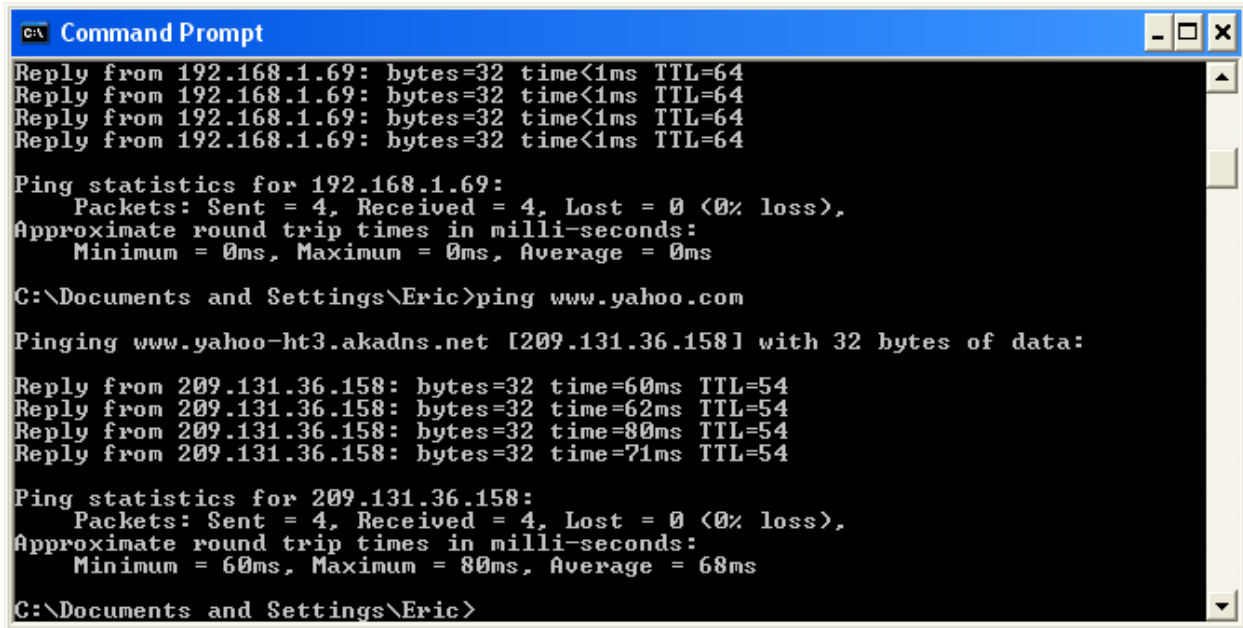
If you get a reply back, the gateway on the network is connected to the computer you are working on, and the Airborne units are working correctly. However, there are a number of other settings that you

need for each computer (and some from your internet service provider) to get to the point where you can "surf the internet".

Assuming that everything works so far, try:

Ping www.yahoo.com:

```
Command Prompt                                                    _ □ ×
Reply from 192.168.1.69: bytes=32 time<1ms TTL=64
Reply from 192.168.1.69: bytes=32 time<1ms TTL=64
Reply from 192.168.1.69: bytes=32 time<1ms TTL=64
Reply from 192.168.1.69: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.69:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\Eric>ping www.yahoo.com

Pinging www.yahoo-ht3.akadns.net [209.131.36.158] with 32 bytes of data:

Reply from 209.131.36.158: bytes=32 time=60ms TTL=54
Reply from 209.131.36.158: bytes=32 time=62ms TTL=54
Reply from 209.131.36.158: bytes=32 time=80ms TTL=54
Reply from 209.131.36.158: bytes=32 time=71ms TTL=54

Ping statistics for 209.131.36.158:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 60ms, Maximum = 80ms, Average = 68ms

C:\Documents and Settings\Eric>
```

If you get a reply back, you should be okay to assume that the internet connection is fine at the computer you are currently working on. If this ping produces an error, you can assume that there is something wrong with the DNS addresses settings in the "Network Settings" section of Windows. Your internet service provider might be able to assist you with what these settings should be.

Keep in mind that the Airborne system behaves exactly like an Ethernet cable does. Also, if you can make a phone call between all the Airborne masters and stations, any networking problems are usually the result of settings in Windows on the computers, or how the internet access and routers are programmed.

In general, if you can phone between stations, the next person to give you help would be the satellite provider, or whoever is providing internet access to the site.

Airborne 58 Specifications

Data Connector	Standard RJ-45
Antenna Connector	N Female
Radio Type	5.8 GHz DSSS License Free
Radio Output Power	500 mW / +26 dBm
Radio Receive Sensitivity	-89 dBm @ 10 -5 BER
Maximum Range	5 kms / 3.5 Miles
Power Required	+24VDC @ 1.0A
Operating Temperature Range	-30C to +50 C / -5F to +125 F
Dimensions	14.75" x 8.75" x 2.5"
Shipping Weight, including packaging	5 kgs / 11 lbs
Mounting brackets	2" Bracket / U-bolts

Warranty Statement:

Teletics warrants the Airborne to be free of defects of materials and workmanship for a period of one year after purchase by the original owner.

Teletics will repair or replace, at its option, any Airborne unit that fails to perform the task it was designed for under normal use, provided the Airborne is returned, at the cost of the owner, to Teletics, or one of Teletics Authorized Repair Facilities in the United States or Canada. Items returned for repair must be accompanied with a problem description and original proof of purchase, such as an invoice.

Any operation of the Airborne outside of specified temperatures, specified input power, environment, or in a manner specified as harmful in this manual will void any warranty. Additionally, any attempted repair or dismantling of any Teletics product, in any way, will void all warranties.

In no event shall Teletics liability exceed the original purchase price of the product from direct, indirect, special, incidental, or consequential damages from the use, or misuse of this product.

Intended Use Statement:

This product is intended for industrial communications use. Installation is to be performed by qualified Radio Technicians.